### NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

| ID | STATE PROJECT NO. | SHEET NO. | TOTAL SHEETS | R-2206C | 8.1830501 | 2 | 90 |

# DIVISION OF HIGHWAYS

# GEOTECHNICAL UNIT

### SUBSURFACE INVESTIGATION

### SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

	SOIL DESCRIPTION		GRADATION			TERMS AND DEFINITIONS	ABBREVIATIONS		
SOIL IS CONSIDERED TO BE THE UNCONSOLIDA	ATED. SEMI-CONSOLIDATED OR WEATHERED EARTH M	NATERIALS WHICH CAN BE PENETRATED	WELL GRADED- INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE						
WITH A CONTINUOUS FLIGHT POWER AUGER, A	AND WHICH YIELDS LESS THAN 100 BLOWS ACCORDI	NG TO STANDARD PENETRATION	POORLY GRADED)	HAT SOIL PARTICLES ARE ALL APPRO	EXIMATELY THE SAME SIZE. (ALSO		BLDR BOULDER	PL - PLASTIC LIMIT	
TEST (ASTN D-1586), SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE:			GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.			APPARENT DIP - THE DIP OF ROCK STRATA NOT PERPENDICULAR TO STRIKE.	CL CLAY	PI - PLASTICITY INDEX	
CONSISTENCY, COLOR, TEXTURE, MOISTURE	E. AASHTO CLASSIFICATION AND OTHER PERTINENT	FACTORS, SUCH AS, MINERALOGICAL	ANGULARITY OF GRAINS			AQUIFER - A WATER BEARING FORMATION OR STRATA.	COB COBBLE	n - POROSITY	
	ASTICITY, ETC. EXAMPLE: VERY STIFF, GRAY SILTY	CLAY, MOIST WITH INTERBEDOED FINE SAND	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: ANGULAR.			AUGER REFUSAL (A.R.) - POINT AT WHICH POWER AUGERS WILL NOT PENETRATE.	CSE COARSE	SD SAND	
LAYERS, HIGHLY PLASTIC, A-7-6.			SUBANGULAR, SUBROUNDER			BEDDED - SOIL OR ROCK LYING IN A POSITION ESSENTIALLY PARALLEL.	EST ESTIMATED	SAT SATURATED	
	ND AND AASHTO CLASSIF	FICATION	MINERALOGICAL COMPOSITION			BEDROCK - ROCK OF RELATIVELY GREAT THICKNESS AND EXTENT IN ITS ORIGINAL LOCATION.	F FINE	SL SILT, SILTY	
GENERAL GRANULAR MATER				QUARTZ, FELDSPAR, MICA, TALC.		CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.  COHESIVE SOIL - A SOIL THAT WHEN UNCONFINED HAS CONSIDERABLE DRY STRENGTH AND	FOSS FOSSILIFEROUS	SLI SLIGHTLY	
CLASS. (≤ 35% PASSING		"	DESCRIPTIONS WHENEVER	R THEY ARE CONSIDERED OF SIGNIFI	CANCE.	SIGNIFICANT COHESION WHEN SUBMERGED.	FRAC FRACTURED		
GROUP A-1 A-3 CLASS. A-1-AA-1-B A-2-4A	A-2 A-4 A-5 A-6 A-7	7 A-1, A-2 A-4, A-5		COMPRESSIBILITY		COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT	GR GRAVEL	<pre>G<sub>S</sub> - SPECIFIC GRAVITY qu - UNCONFINED COMPRESSIVE STRENGTH</pre>	
00000000000000	a-2-5A-2-6A-2-7	5 A-3 A-6, A-7	SLIGHTLY COMPRESSIBLE MODERATELY COMPRESSIBLE		LIQUID LIMIT LESS THAN 30 LIQUID LIMIT 31-50	BOTTOM OF SLOPE.	LL - LIQUID LIMIT		
SYMBOL 000000000000000000000000000000000000		V:::::::	HIGHLY COMPRESSIBLE		LIQUID LIMIT GREATER THAN 50	CORE RECOVERY (% REC.) - TOTAL LENGTH OF ALL ROCK DIVIDED BY TOTAL LENGTH OF CORE	MED MEDIUM	7 - UNIT WEIGHT (WET UNIT WEIGHT)	
% PASSING		CUT		ROCK DESCRIPTION		RUN AND EXPRESSED AS A PERCENTAGE.  COULINA - A ROCK TYPE COMPOSED ESSENTIALLY OF MARINE SHELLS CEMENTED BY CALCIUM CARBONATE.	W - MOISTURE CONTENT	$\gamma_{ m d}$ - DRY UNIT WEIGHT	
• 10 50 MX • 40 30 MX 50 MX 51 MN		GRANULAR SILT- MUCK, SOILS CLAY PEAT	IN THE BROADEST MEAN!	NG, HARD ROCK IS CONSIDERED THA	AT MATERIAL WHICH CANNOT BE	DIKE - IGNEOUS ROCK INTRUSION WHICH IS NARROW COMPARED WITH ITS OTHER DIMENSIONS.	MOT MOTTLED	7SAT - SATURATED UNIT WEIGHT	
	35 MX35 MX35 MX36 MN36 MN36 MN36 M			IAL SOIL SAMPLING TOOLS OR TECHN		DIP - THE ANGLE BETWEEN A BEDDING PLANE, JOINT PLANE OR FAULT PLANE AND THE	OM - OPTIMUM MOISTURE	e - VOID RATIO	
				TRARY. TRANSITION BETWEEN SOIL		HORIZONTAL, MEASURED PERPENDICULAR TO THE STRIKE.	ORG ORGANIC	V VERY	
	#1 MN 40 MX 41 MN 40 MX 41 MN 40 MX 41 M  0 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 M	WI SOILS MILL	MATERIALS ARE DIVIDED	RED ROCK*. FOR THE PURPOSE OF TH	HIS INVESTIGATION, THESE	DUMPS - UNCOVERED DEPOSITS OF WASTE MATERIAL SUCH AS WOOD, MASONRY DEBRIS OR GARBAGE.			
		HIGHLY	6 26 26			FAULT - A BREAK IN THE CONTINUITY OF A BODY OF ROCK, ATTENDED BY A MOVEMENT ON			
	AMOUNTS OF			SUFI MATERIAL THE	AT CAN BE PENETRATED WITH SOME		CAUTION NOTICE	7	
	TY OR CLAYEY SILTY CLAYEY	ORGANIC	WEATHERED ROCK		USING POWER AUGERS AND YIELDS 100 BLOWS BUT < SPT REFUSAL	FINES - PORTIONS OF A SOIL FINER THAN NO. 200 U.S. STANDARD SIEVE.	CAUTION NOTICE	y .	
MATERIALS SAND SAND GRAV	VEL AND SAND   SOILS   SOILS	MATTER	(SWR)		AT CAN BE PENETRATED WITH GREAT	FISSILITY OR FISSILE - A PROPERTY OF SPLITTING EASILY ALONG CLOSELY SPACED PARALLEL	THE SUBSURFACE INFORMATION AND THE SUBSI	JRFACE INVESTIGATION ON WHICH IT IS BASED WAS MADE	
GEN. RATING		FAIR TO DOOR	(HWR)	WEATHERED DIFFICULTY (	USING POWER AUGERS AND YIELDS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED	FOR THE PURPOSE OF STUDY, PLANNING AND D	ESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES.	
AS A EXCELLENT TO C	GOOD FAIR TO POOR	POOR UNSUITABLE	HARD CORED BOOK	ROCK SPT REFUSAL.		FROM PARENT MATERIAL.	SOME DATA OBTAINED MAY BE OMITTED FROM		
			HARD CORED ROCK INFERRED ROCK MATERIAL THAT CANNOT BE PENETRATED BY POWER AUGERS, EXCEPT IN THIN LEDGES, AND REQUIRES			FLOODPLAIN - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.	ADDITIONAL INFORMATION MAY BE AVAILABLE, I'	NCLUDING, BUT NOT LIMITED TO THE FOLLOWING:	
	≤L.L 30 : P.I. OF A-7-5 > NSISTENCY OR DENSENES		1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2			FORMATION - A MAPPABLE UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.	FIELD BORI	NC LOGS	
	DANCE OF CTANDADD	RANGE OF UNCONFINED	"SPT REFUSAL ≤2.5cm OF PENETRATION PER 50 BLOWS.			FRACTURE - A CRACK LARGE ENOUGH TO BE VISIBLE TO THE UNAIDED EYE.	ROCK CO		
	PENETRATION RESISTENCE	COMPRESSIVE STRENGTH	** AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH AUGERS COULD NO LONGER			FRIABLE - EASY TO BREAK OR CRUMBLE.	SOIL & ROCK TEST DATA		
	(BLOWS)	(kN/m <sup>2</sup> )	PENETRATE. THE HARD	D ROCK SYMBOL IS SHOWN WHEN ROC	K IS CORED AND ONLY TO THAT		SUBSURFACE	E REPORT	
VERY L	1		DEPTH CORED. A DESC	SCRIPTION OF ROCK IS GIVEN INCLU	JD I NG:	GRANULAR MATERIAL - SOIL THAT WHEN UNCONFINED HAS LITTLE OR NO DRY STRENGTH AND HAS LITTLE OR NO COHESION WHEN SUBMERGED.	THIS INFORMATION MAY BE VIEWED BY APPOINT	MENT BY CONTACTING THE N. C. DEPARTMENT OF	
GENERALLY LOOS GRANULAR MEDIUM	SE 4 TO 10 M DENSE 10 TO 30	N/A	CORE RECOVERY (REC.	.) - TOTAL LENGTH OF ROCK RECOVE	RED IN THE CORE BARREL DIVIDED	GROUNDWATER (G.W.) - WATER THAT IS FREE TO MOVE THROUGH SOIL MASS UNDER THE INFLUENCE	TRANSPORTATION, GEOTECHNICAL UNIT @ (919) 2	250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS	
MATERIAL DENS		1	1	BY THE TOTAL LENGTH OF THE		OF GRAVITY.	NOR THE FIELD BORING EUGS, RUCK CORES, OF	R SOIL TEST DATA IS PART OF THE CONTRACT.	
VERY (	DENSE >50		ROCK QUALITY DESIGN	SNATION (ROD) - TOTAL LENGTH OF S		GROUNDWATER LEVEL - LEVEL OF WATER WITH RESPECT TO EXISTING GROUND SURFACE.	GENERAL SOIL AND ROCK STRATA DESCRIPTION	IS AND INDICATED BOUNDARIES ARE BASED ON A	
VERY S		<25	Í		HAN OR EQUAL TO 0.1m DIVIDED OTH OF THE CORE RUN TIMES 100%.	HARDPAN - A GENERAL TERM USED TO DESCRIBE A HARD CEMENTED SOIL LAYER WHICH DOES NOT SOFTEN WHEN WET.	GEOTECHNICAL INTERPRETATION OF ALL AVAILA	ABLE SUBSURFACE DATA AND MAY NOT NECESSARILY	
GENERALLY SOFT	T 2 TO 4 M STIFF 4 TO 8	25 TO 50		GROUND WATER	THE CONE NOW TIMES TOOM		WITHIN THE BOREHOLE, THE LABORATORY SAMP	S BETWEEN BORINGS OR BETWEEN SAMPLED STRATA LE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE	
SILT-CLAY   STIE		50 TO 100 100 TO 200	✓ WATER LE	EVEL IN BORE HOLE IMMEDIATELY A	ETER ORILLING	INDURATED - EARTH MATERIAL HARDENED BY HEAT, PRESSURE OR CEMENTATION.	RELIED ON ONLY TO THE DEGREE OF RELIABILI	TY INHERENT IN THE STANDARD TEST METHOD.	
MATERIAL VERY		200 TO 400			. ven briterno.	INTERBEDOED - ALTERNATING LENSES OR LAYERS OF SOIL AND/OR ROCK MATERIALS.	THE OBSERVED WATER LEVELS OR SOIL MOIST!	URE CONDITIONS INDICATED IN THE SUBSURFACE	
HARD >30 >400			STATIC WATER LEVEL AFTER 24 HOURS.  PERCHED WATER, SATURATED ZONE OR WATER REARING STRATA			JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.  LAMINATED - VERY THIN ALTERNATING LAYERS LESS THAN INCH.	MOISTURE CONDITIONS MAY VARY CONSIDERABL	ME OF THE INVESTIGATION, THESE WATER LEVELS OR SOIL Y WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDIN	
TEXTURE OR GRAIN SIZE PERCHED WATER, SATURATED ZONE OR WATER BEARING STRA					BEARING STRATA	LAYER - SUBJECT MATERIAL GREATER THAN LINCH IN THICKNESS.	TEMPERATURES, PRECIPITATION AND WIND, AS	WELL AS OTHER NON-CLIMATIC FACTORS.	
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OFFING OR SEEPAGE							THE BIDDER OR CONTRACTOR IS CAUTIONED TO	IAT DETAILS SHOWN ON THE SUBSURFACE PLANS	
	4.76 2.0 0.42 0.25 0.0		0 00			LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.	ARE PRELIMINARY ONLY AND IN MANY CASES T	THE FINAL DESIGN DETAILS ARE DIFFERENT, FOR BIDDING	
			MISCE	LLANEOUS SYMBOLS AND	ABBREVIATIONS	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.	AND CONSTRUCTION PURPOSES, REFER TO THE	CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN	
BOULDER COBBLE GR	RAVEL COARSE FINE		ROADWAY EMBA	ANKMENT SPT	SAMPLE	MARL - A NON-INDURATED, CALCAREOUS DEPOSIT OF CLAYS, SILTS AND SANDS, OFTEN	OR ACCURACY OF THE INVESTIGATION MADE N	ENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR THE INTERPRETATIONS MADE OR OPINIONS OF THE	
	J SAME	<u> </u>	WITH SOIL DE		T BORING DESIGNATIONS	CONTAINING SHELLS.	DEPARTMENT AS TO THE TYPE OF MATERIALS	AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR	
GRAIN MM 305 75	2.0 0.25	0.05 0.005	L	AUF.	ER BORING S- BULK SAMPLE	MICACEOUS SOIL (MIC.) - A SOIL OR ROCK TYPE CONTAINING AN APPRECIABLE AMOUNT OF MICA.	CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS		
SIZE IN. 12" 3"			1 1				NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME F		
	STURE - CORRELATION C	)F TERMS		FILL OTHER THAN COR	E BORING SAMPLE	MUCK (MK.) - A HIGHLY ORGANIC SOIL OF VERY SOFT CONSISTENCY, GENERALLY FOUND ON TIDAL FLATS, LAKE OR STREAM FLOODPLAINS.	ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM		
SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE GUIDE FOR	FIELD MOISTURE DESCRIPTION	ST- SHELBY TUBE  SAMPLE  SAMPLE  RS- ROCK SAMPLE			PEAT (PT) - A FIBROUS MASS OF ORGANIC MATTER IN VARIOUS STAGES OF DECOMPOSITION.	THOSE INDICATED IN THE SUBSURFACE INFORMATION.  NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTM OF TRANSPORTATION AS BEING ACCURATE NOR IS IT CONSIDERED TO BE PART OF THE PLANS,		
(HITERBERG LIMITS)	DESCRIPTION COLDE FOR					PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE			
ļ	- SATURATED - USUALLY	LIQUID; VERY WET, USUALLY				OF AN INTERVENING IMPERVIOUS STRATUM.		IS IT CONSIDERED TO BE PART OF THE PLANS,	
LL _ LIQUID LIMIT	(SAT.) FROM BEL	OW THE GROUND WATER TABLE	A INCOLUCION			RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.	SPECIFICATIONS, OR CONTRACT FOR THE PROJECT	т.	
PLASTIC	SEMISOL I	D: REQUIRES DRYING TO	125° DIP DIRECTION AND			ROCK - SEE LEGEND	NOTE - BY HAVING REQUESTED THIS INFORMAT	ON THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS	
RANGE (PI)		PTIMUM MOISTURE	<b>-</b>	( )	E INDICATOR ●- SOUNDING ROD ALLATION	ROCK QUALITY DESIGNATION (R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL	FOR INCREASED COMPENSATION OR EXTENSION CONDITIONS INDICATED HEREIN AND THE ACTUA	OF TIME BASED ON DIFFERENCES BETWEEN THE	
"PLL + PLASTIC LIMIT			■ APPARENT DIP			LENGTH OF CORE RUN EXPRESSED AS A PERCENTAGE.	CONDITIONS INDICATED HEREIN AND THE ACTOR	AL CONDITIONS AT THE PROJECT SITE.	
OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE			(NORMAL TO)  SPT N-COUNT			SANITARY LANDFILLS - COMPACTED AND/OR COVERED LAYERS OF SOIL AND WASTE PRODUCTS.			
OM OPTIMUM MOISTURE SL SHRINKAGE LIMIT	- NOIS! - (N) 30210; H	ON NEWN OFTIMOR MOISTORE	FOUTE	PMENT USED ON SUBJECT	DDO JECT	SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF	NOTES:		
T Samurate Elivir	DECULOR	ADDITIONAL WATER TO	DRILL UNITS:	AUGER TOOLS:		THE PARENT ROCK.			
		ADDITIONAL WATER TO PTIMUM MOISTURE	DRILL ON113+		HAMMER TYPE:	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A	1		
			MOBILE B-56	6" (I52 mm) CONTINUOUS FLIGHT	AUTOMATIC MANUAL	SILL - AN IGNEOUS SHEET OF INTRUSIVE ROCK WHOSE THICKNESS IS SLIGHT COMPARED TO			
PLASTICITY PLASTICITY INDEX DRY STRENGTH				8° (203 mm) HOLLOW AUGERS	CODE DODANG TOTAL	ITS LATERAL EXTENT.	1		
	FEMOLICIET INDEX					SOME - PRESENCE OF 5% TO 30% OF SUBJECT MATERIAL.	1		
NONPLASTIC	0-5	VERY LOW	CME - 45	HARD FACED FINGER BITS	-AX -BX -NX	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR B.P.F.) OF	1		
LOW PLASTICITY MED. PLASTICITY	6-15 16-25	SLIGHT MEDIUM	CME-550	TUNG CARBIDE INSERTS	HAND TOOLS:	A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER SPT REFUSAL PENETRATION RESISTANCE OF LESS	1		
HIGH PLASTICITY	26 OR MORE	HIGH		1—	POST HOLE DIGGER	THAN TINCH WITH 50 BLOWS.	1		
COLOR			PORTABLE HOIST	CLAY BITS	I —	STRIKE - THE DIRECTION OR BEARING OF A HORIZONTAL LINE IN THE PLANE OF AN	1		
HAND AUGER					HAND AUGER	INCLINED STRATUM, JOINT, FAULT OR OTHER STRUCTURAL PLANE.	1		
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, BLUE-GRAY)  MODIFIEDS SUCI AS A LIGHT BROWN MOTERS CONSTRUCT BROWN MOTERS AND MODIFIED CONSTRUCT BROWN MODIFIED CONSTRUCT B						SUBGRADE . THE SOIL PREPARED TO SUPPORT A STRUCTURE OR A PAVEMENT SYSTEM.	1		
MODIFIERS SUCH AS LIGHT, DARK, MUTILEU, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE!						TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.	ĺ		
			· · · · · · · · · · · · · · · · · · ·		VANE SHEAR TEST	TRACE - PRESENCE OF LESS THAN 5% OF SUBJECT MATERIAL.	1	REVISED AUGUST 10, 1998	